aggressive chemotherapy and radiotherapy on future fertility are being increasingly realized in males. To counteract such deleterious effects, we initiated a formal fertility preservation program in 2007 to increase access to sperm cryopreservation (SCP) services at our institution. Here we analyze our program's utility and patient data to provide insight into fertility preservation prior to SCT.

Methods: An IRB-approved chart review was conducted on all male pediatric patients older than 13 years who underwent SCT between January 2008 and June 2010 at our institution. Patients given a fertility preservation consult were identified, and the semen parameters of those subsequently banking sperm were obtained.

Results: During the study interval, 22 male pediatric patients met our study criteria, of which there were 19 allo-transplants and 3 auto-transplants. 8/22 (36%) patients were given fertility preservation consults and 6/22 (27%) proceeded to SCP, a consult success rate of 75% (Table 1). 6/13 (38%) patients with planned radiotherapy were consulted, compared to 2/9 (22%) patients with no planned radiotherapy. Of the 6 patients banking sperm, 3 banked prior to chemotherapy while 3 banked after. The average semen parameters of patients banking before chemo vs after chemotherapy were as follows: Volume 2.50 vs 1.50 ml; Concentration 30.7 vs 30.6 million/ml; Motility 36.7% vs 21.3%; Normal Morphology 9.7% vs 3.5%. Thus, while patients who banked after chemotherapy had sub-fertile semen parameters, their bulk semen parameters were still adequate for cryopreservation. All bulk semen parameters tended to improve as age at banking increased.

Conclusions: The high fertility preservation consult success rate indicates a large desire to preserve fertility in patients planning SCT. While bulk semen parameters were adequate for cryopreservation in patients after treatment, DNA damage resulting from chemotherapy was not assessed. Although cryopreservation of some sperm is preferred over none, ample literature supports the notion that chemotherapy has a deleterious effect on fertilization and embryo development outcomes. Thus, every effort should be made to cryopreserve sperm prior to chemotherapy and radiation. Finally, further initiatives are required to extend the opportunity of fertility preservation to all SCT patients.

Table 1. Demographic Comparison of All SCT Patients vs. Consulted Patients

	All Patients (N = 22)	Consulted Patients (N = 8)
Year		
2008	10	4
2009	9	3
2010	3	1
Transplant Type		
Allogenic	19	7
Autologous	3	1
Ethnicity		
Caucasian	12	5
African American	4	1
Hispanic	5	2
Other	1	0

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REPEAT READMISSIONS AFTER ALLOGENEIC HEMATOPOIETIC PROGENITOR CELL TRANSPLANTATION (HPCT)

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Hospital readmissions increase healthcare cost and are a target of ways to improve cost and quality of medical care. Patients (pts) who undergo allogeneic hematopoietic progenitor cell transplant require a high level of care and are often readmitted. Thirty-day hospital readmissions following allogeneic HPCT, however, are associated with poor survival. In this retrospective review, we evaluated our 30-day readmissions for allogeneic HPCT occurring in 2010 at our institution. The analysis included pts who were not only transplanted in 2010 but also those who had been previously transplanted (ranging from 1994-2010), and later hospitalized again in 2010 and subsequently readmitted within 30 days.

There were 83 total readmissions for allogeneic transplant pts within 30 days of a prior hospitalization in 2010. Only 47 pts, however, accounted for these readmissions and 19 (23%) pts were admitted multiple times (range 2-5 times), accounting for 55 (66%) of the readmissions. Initial diagnoses for pts admitted more than once included: 7 refractory NHL, 4 AML, 3 ALL, 2 MDS, 2 AA and 1 CML. Donor type included 4 UCB, 5 MUD and 10 MSD. Fifty-two percent (n = 10) had a CIBMTR transplant co-morbidity index score of >2. Fifty-three (64%) of the 30d readmissions after allogeneic HPCT were due to infection or unexplained fever, followed by 9 (11%) for symptoms related to GVHD, 7 (8%) due to cardiac complications (CHF, arrhythmias), and 14 (17%) others related to symptom management (pain, nausea/vomiting, diarrhea not related to infection or GVHD). Looking specifically at reasons for subsequent repeated readmissions demonstrated a similar distribution with the majority of re-hospitalizations being for infection or unexplained fever, followed by symptom management, cardiac complications, and GVHD. There were 13 deaths, all related to infection or complications from GVHD. Median time to death after readmission was 27 days (range, 0 to 96).

Readmissions for allogeneic HPCT are associated with worse survival. In this retrospective review we have found that the majority of readmissions were from pts admitted multiple times. About half of these pts were identified as having higher co-morbidity index scores. Further prospective studies of readmission trends in allogeneic transplant and identification of high risk pts who may be susceptible to multiple readmissions may help decrease readmission rates, transplant outcomes, and improve overall quality of care.

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VENOUS THROMBOEMBOLISM IN ALLOGENEIC HEMATOPOEITIC STEM CELL TRANSPLANTATION – THE INCIDENCE, CHARACTERISTICS AND MANAGEMENT – A SINGLE INSTITUTION EXPERIENCE

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Background: The association between venous thromboembolism (VTE) and hematologic malignancy is well established. However, VTE after allogeneic hematopoietic cell transplantation (HCT) is not well characterized. The management is not standardized and varies between hematologists.

Methods: A total of 260 patients underwent allogeneic HCT at the University of Iowa between 2004 and 2009. Patient's data were retrospectively abstracted from the electronic medical record and bone marrow transplant database. We report the incidence, characteristics, management and outcome of VTE following allotransplant.

Results: Of 260 patients who underwent allogeneic HCT, 35 (13.5%) developed VTE events. The median time from transplant to VTE diagnosis was 121 days (-3 to 1853 d). Twenty-two patients (63%) developed VTE during the first six months post allotransplant. Sixteen patients (47%) had central venous catheter related VTE. At VTE diagnosis, six patients (17%) had active hematologic malignancy and 18 patients (51%) had active GVHD (≥ grade III). The median platelet count at VTE diagnosis was 65 (5-676) x 10^6/mm^3. Twenty-five patients (71%) received systemic anticoagulation (17 heparin products VS 8 heparin followed by warfarin). Eight of 25 patients (32%) who had anticoagulation treatment received therapeutic dose of anticoagulant whereas 17 patients had prophylactic dose. Among 10 patients who did not receive systemic anticoagulation treatment either due to clinical active bleeding or severe thrombocytopenia, two underwent inferior vena cava filter placement. Eight patients (32%) had hemorrhagic complications during anticoagulation. The median anticoagulation

Table. Characteristics of Patients Who Developed VTE after Allotransplant: Early VS Late

	Early VTE (≤6 mo)	Late VTE (>6 mo)	
	N = 22 (%)	N = 13 (%)	p-value
Gender (M/F)	17/5	6/7	0.06
Median age at allotransplant, years (range)	56 (20-63)	55 (38-64)	0.88
Diagnosis required allotransplant			0.31
Acute Leukemia	13 (60%)	6 (46%)	
Myelodysplastic Syndrome	4 (18%)	0 (0%)	
Myeloproliferative Neoplasm	1 (4%)	3 (23%)	
Non Hodgkin Lymphoma	2 (9%)	2 (15%)	
Chronic Lymphocytic Leukemia	2 (9%)	1 (8%)	
Multiple Myeloma	0 (0%)	1 (8%)	
Past history of VTE prior to allotransplant	5 (23%)	4 (31%)	0.60
History of tobacco smoking	10 (46%)	6 (46%)	0.97
Atherosclerotic risk factors*	7 (32%)	4 (31%)	0.94
Conditioning regimen			0.15
Myeloablative	17 (77%)	7 (54%)	
Reduced Intensity	5 (23%)	6 (46%)	
Stem Cell source			0.62
Bone marrow	5 (23%)	2 (15%)	
Peripheral blood	16 (73%)	11 (85%)	
Cord blood	1 (4%)	0 (0%)	
HCT-CI†			0.09
0	2 (9%)	3 (23%)	
1-2	9 (41%)	1 (8%)	
≥3	11 (50%)	9 (69%)	
ECOG Performance status at VTE diagnosis			0.12
0-2	13 (59%)	11 (85%)	
3-4	9 (41%)	2 (15%)	
Pharmacologic VTE prophylaxis	1 (4%)	0 (0%)	0.44
Time from allotransplant to VTE, days (range)	98 (-3 to 174)	393 (208 to 1853)	<0.0001
Active hematologic malignancy at VTE	2 (9%)	4 (31%)	0.10
Active graft versus host disease (≥grade3)	10 (46%)	8 (62%)	0.36
Central venous catheter related VTE	15 (68%)	1 (8%)	0.001
Median platelet count (x10^6/mm^3) (range)	54 (5-193)	95 (26-676)	0.031

*Atherosclerotic risk factors - obesity (body mass index > 30%), hypertension, dyslipidemia, diabetes mellitus.
†Hematopoietic Cell Transplantation-Comorbidity Index.

duration was 53 days (range, 6-877 d). The reasons of treatment discontinuation included complete clinical response (32%), clinically significant bleeding (32%), progressive thrombocytopenia (24%) or others (12%). Six patients (17%) subsequently developed recurrent VTE and one of these occurred during anticoagulation. **Conclusion:** VTE may be a more frequent complication of allotransplant than previously recognized. Treatment of VTE following allotransplant is challenging due to patients' complexity and potential complications. Prospective studies are warranted to establish the appropriate strategies for prevention and management.

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NEW ONSET OF SEVERE ALLERGIC MANIFESTATIONS IN LONG TERM SURVIVORS AFTER CORD BLOOD TRANSPLANTATION

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Background: Umbilical-cord-blood-transplantation (CBT) is an effective treatment for benign and malignant diseases. Late effects of CBT are not well described in the literature. In this study, we present our experience with new onset allergies after CBT.
Methods: After the first patient experienced new onset severe allergy related to peanut exposure, all CBT patients at a single center were prospectively followed for new allergy development. Presence of allergy was defined as a positive skin test or by radioallergosorbent test (RAST). Symptomatic allergy requiring immediate attention with clinical manifestations also defined as allergic disease.
Results: Fifty patients received CBT between March 2006 and June 2011. The majority of patients (n = 43) received CBT for hematological malignancies. The median follow-up after CBT was 445 days (range, 12-2022). Twenty eight (56%) patients underwent myeloablative and 22 (44%) received reduced-intensity conditioning regimen CBT. Acute GVHD (grade III-IV) occurred in 14 (28%) and chronic GVHD occurred in 14 of 41 patients (34%) surviving beyond 100 days. At the time of analysis, 30 patients were alive with 3 year actuarial survival of 55.5%; median follow-up of surviving patients was 910 days (range, 68-2022). The allergic syndrome developed in 5 patients, with Kaplan-Meier cumulative probability of 18.4±7.6%. The median time to onset of new allergy presentation after transplantation was 298 days (range, 250 to 809). Severity and types of allergies described in Table 1. Among 6 patients (2 with allergies), trends were seen between tissue-homing Treg subsets at engraftment and the development of peanut allergies with allergic individuals characterized by decreased CLA+ (skin-homing) Tregs (median, 3.22% vs. 1.12%; P = 0.064) and increased a4β7+ (gut-homing) Tregs (median, 22.0% vs. 41.0%; P = 0.064) (no allergy vs. allergy, respectively).
Conclusion: This observation is important as it has therapeutic implications in long term survivors after CBT. Allergy development has been linked to a delayed maturation of the immune system in several different studies. Th2-biased immune reconstitution after CBT could be the mechanism for allergy transfer via cytokines induced IgE synthesis. Impairment of regulatory T-cells after CBT is believed to be also one contributing factor in allergic disease. Counseling of patients to this previously unknown complication of CBT is recommended.